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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,625	04/14/2004	Jae-cheol Lee	030681-648	4636

21839 7590 03/29/2005

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POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER	
BUEKER, RICHARD R	
ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 03/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/823,625

Applicant(s)

LEE ET AL.

Examiner

Richard Bueker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

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Claims 4, 8 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "adiabatic" in claims 4, 8 and 9 is used by the claim to mean "thermal insulation", while the accepted meaning is "occurring without loss or gain of heat." "Adiabatic" is not a synonym for "thermal insulation". The term is indefinite because the specification does not clearly redefine the term. It is suggested that applicants amend their specification and claims to change all occurrences of "an adiabatic material" to "a thermal insulation material" or "a thermally insulating material".

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 1-4, 15, 18, 16, 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pawlyk (2,704,727) taken in view of Antell (GB 2,223,509). Pawlyk (Figs. 1 and 2) discloses a solid source vaporizer, comprising a powder source container 4 having a gas inlet 5 and gas outlet 6, a heating unit 3, 29 for heating the container, a temperature sensor 37 and temperature controller (col. 2, lines 35-38), and a carrier gas inlet tube which includes a preheating portion wound on the outer circumference of the container. Pawlyk doesn't explicitly state that a cover is installed in an upper portion of the container. Antell (Fig. 2 and page 3, lines 21-23) also discloses a solid source vaporizer container, and he teaches that the container can usefully be constructed by installing a cover 13 in an upper portion of a cylinder 12. It would have been obvious to construct the container of Pawlyk by providing it with a cover because Antell teaches that a container constructed in that manner can successfully be used as a solid source vaporizer container. It is noted that the claim 1 reference to atomic layer deposition is a recitation of intended use that does not so limit the present apparatus claims. Regarding claims 25-27, Antell also teaches that carrier gas inlet and outlet tubes can successfully be connected as described in these claims, and for that reason it would have been prima facie obvious to connect Pawlyk's inlet and outlet on the side of the container.

Claims 10-12 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pawlyk (2,704,727) taken in view of Antell (GB 2,223,509) taken in further view of Sandhu (2003/0072875). Pawlyk teaches the use of an electric heater 29 to heat the casing 2, but does not discuss the use of a

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thermoelectric device such as a Peltier device as the heater 29. Sandhu (Fig. 3 and paragraph 28), however, teaches that the heater 108 that heats a solid source vaporizer container can be a Peltier effect heater. Furthermore, Sandhu teaches (paragraph 28) that the Peltier effect heater 108 does not need to be in direct contact with the surface 106, which transmits heat to the solid source. Sandhu teaches that any coupling can be used to transfer energy from heater 108 to surface 106. From these teachings of Sandhu it would have been obvious to one skilled in the art that a conventional prior art heat transfer means such as the heating bath of Pawlyk can be used in combination with the Peltier effect heater suggested by Sandhu. It would have been obvious to substitute the Peltier effect heater suggested by Sandhu for the electric heater of Pawlyk, because Sandhu makes clear that a solid source precursor can successfully be vaporized by employing a Peltier effect heater. Regarding claim 26, Sandhu (see Fig. 26) also teaches that a carrier gas inlet can successfully be connected in a middle portion of a container.

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pawlyk (2,704,727) taken in view of Antell (GB 2,223,509) taken in further view of Sandhu (2003/0072875) for the reasons stated above, taken in further view of Sugioka (4,516,527) (col. 3, lines 46-68), who teaches that the thermal contact between a Peltier heating device and a vaporizer container can be improved by interposing a thermally conductive compound or pad. It would have been obvious to use such a thermal conductivity

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improvement means with the Peltier effect heater suggested by Sandhu, for the desirable purpose of improving thermal conductivity.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pawlyk (2,704,727) taken in view of Antell (GB 2,223,509), and in further view of Bailey (5,076,206) (Figs. 4 and 5 and col. 4, lines 22-24 and 52-54) who teaches that a gas preheating tube can be in serpentine form. It would have been obvious to wind a carrier gas preheating tube of the type taught by Pawlyk in a serpentine form on vaporizer container, because Bailey teaches that a gas can successfully be preheated by using a tube in such a shape.

Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pawlyk (2,704,727) taken in view of Antell (GB 2,223,509) taken in further view of Hiai (5,019,423) and Visser (5,322,710). Hiai (5,019,423) (col. 5, lines 41-44) teaches that a powder source vaporizer container can be made of any material of construction (glass, resin or metal) that is inert to the powder. Also, Visser (the Fig., col. 4, lines 37-39 and col. 6, lines 19-34) teaches that it was known in the art that vaporizer containers can be constructed of quartz. It would have been prima facie obvious to construct the container of Pawlyk of quartz when using a precursor material that was inert to quartz. Regarding claims 18-20, Pawlyk teaches the use of container 2 as an external container surrounding internal container 4. Also, the use of stainless steel for the tank 2 of Pawlyk would have been obvious in view of the well-known corrosion resistant nature of this commonly used metal.

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Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pawlyk (2,704,727) taken in view of Antell (GB 2,223,509) taken in view of Lei (2003/0053799). Lei (Fig. 1) teaches the use of a plurality of guide plates to create a zigzag gas flow path in a solid source precursor. It would have been obvious to use the vaporizer container of Lei in the gas source apparatus of Pawlyk because Lei teaches that his guide plate arrangement provides a controlled and reproducible rate of vaporization.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pawlyk (2,704,727) taken in view of Antell (GB 2,223,509) and Lei (2003/0053799), and in further view of Hiai (5,019,423) or Visser (5,322,710). Lei (para. 27) teaches that his plates can be made of ceramics. Also, Hiai (5,019,423) (col. 5, lines 41-44) teaches that a solid source vaporizer container can be made of any material of construction (glass, resin or metal) that is inert to the powder. Also, Visser (the Fig., col. 4, lines 37-39 and col. 6, lines 19-34) teaches that it was known in the art that vaporizer containers can be constructed of quartz. It would have been prima facie obvious to choose glass or quartz as the ceramic material suggested by Lei, in view of the teachings of Hiai or Visser.

Claims 1-4, 6-8, 15, 16, 18 and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jurgensen (WO 02/27064) taken in view of Tsuboi (JP 2001104769) or Pawlyk (2,704,727) and in view of applicants' description of the prior art described at pages 1-4 and Fig. 1 of their specification. Jurgensen (US 2003/0192471), which is a patent family equivalent of Jurgensen (WO 02/27064), will be used as an English translation in the statement of the rejection

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below. Jurgensen (Figs. 3 and 4) discloses a solid source vaporizer for supplying CVD precursor gas to a reaction chamber, comprising a powder source container having a gas inlet and gas outlet, a heating unit for heating the container, a cover installed in an upper portion of the container, and a carrier gas inlet tube which includes a preheating portion wound on the outer circumference of the container. Jurgensen (paragraph 19) teaches that his carrier gas inlet tube is coiled within the heater 7 in close proximity to the vaporizer container. It is noted that "coiled" is a synonym for "wound". Also, Tsuboi (Fig. 3) and Pawlyk (Fig. 1) teach that it is desirable to wind a carrier gas tube on an outer circumference of a vaporizer container to ensure that the carrier gas is preheated to the same temperature as the vaporizer container. Therefore, it would have been obvious to wind Jurgensen's carrier gas tube around his vaporizer container, because Tsuboi and Pawlyk make clear that this arrangement will successfully preheat the carrier gas to the needed temperature. Jurgensen doesn't discuss the use of a temperature sensor or temperature controller. Tsuboi (Fig. 3), Pawlyk (Fig. 1) and applicants' description of the prior art (Fig. 1) all teach the use of a temperature sensor and controller to maintain a desirably constant temperature in their vaporizers. It would have been obvious to provide the vaporizer of Jurgensen with a temperature sensor and controller because Tsuboi, Pawlyk and applicants' description of the prior art teach that the use of a temperature sensor and controller will provide a desirably constant temperature in a vaporizer. Regarding the casing recited in claims 3 and 4, it would have been obvious to provide the heater of Jurgensen with a casing because

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applicants' description of the prior art (page 2, lines 19-21) teaches that it was known to be desirable to provide a heater casing to protect and thermally insulate the heater. Regarding claim 6, Jurgensen (see Fig. 3, elements 15, para. 8, lines 37-40 and para. 19) teaches the use of heater rods 15 supported by the cover 9.

Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jurgensen (WO 02/27064) taken in view of Tsuboi (JP 2001104769) or Pawlyk (2,704,727) and in view of applicants' description of the prior art for the reasons stated above, taken in further view of Hillman (5,451,258) or Tsukada (6,319,327). Applicants' description of the prior art states that the purpose of the casing 20 of Fig. 1 is to prevent heat from dissipating. Hillman (see Fig. 1 and col. 5, lines 14-31) and Tsukada (see Fig. 1, elements 64a and 64b and col. 7, lines 4-39) each teaches that heat can be more completely prevented from a dissipating from a heated chamber by providing a layer of thermal insulation on the inside surface of the heated chamber, and in view of this teaching it would have been obvious to provide the heated chamber of applicants' Fig. 1 with an insulation layer.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jurgensen (WO 02/27064) taken in view of Tsuboi (JP 2001104769) or Pawlyk (2,704,727) and in view of applicants' description of the prior art, and taken in further view of Bailey (5,076,206) (Figs. 4 and 5 and col. 4, lines 22-24 and 52-54) who teaches that a gas preheating tube can be in serpentine form. It would have been obvious to wind a carrier gas preheating tube of the type taught by Tsuboi or Pawlyk in a serpentine form on vaporizer container, because Bailey

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teaches that a gas can successfully be preheated by using a tube in such a shape.

Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jurgensen (WO 02/27064) taken in view of Tsuboi (JP 2001104769) or Pawlyk (2,704,727) and in view of applicants' description of the prior art, and taken in further view of Hiai (5,019,423) and Sielaff (4,861,524). Hiai (5,019,423) (col. 5, lines 41-44) teaches that a powder source vaporizer container can be made of any material of construction (glass, resin or metal) that is inert to the powder. Also, Sielaff (Figs. 1 and 2, col. 2, lines 42-62 and col. 3, lines 25-26) teaches that it was known in the art that vaporizer containers can be constructed of quartz-lined metal. Sielaff teaches that the quartz eliminates a potential source of contamination and the metal promotes temperature uniformity. It would have been prima facie obvious to construct the container of Jergensen of quartz-lined metal when using a precursor material that was inert to quartz. Regarding claim 20, it would have been obvious to use stainless steel as the metal of Sielaff in view of applicants' description of the prior art (page 2, lines 7-8) which makes clear that stainless steel was commonly used for constructing sources.

Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jurgensen (WO 02/27064) taken in view of Tsuboi (JP 2001104769) or Pawlyk (2,704,727) and in view of applicants' description of the prior art, and taken in further view of Hiai (5,019,423) and Antell (GB 2,223,509), who disclose vaporizer containers having the carrier gas inlet and/or outlet tube horizontally connected to the container, such that the gas is not injected toward the powder.

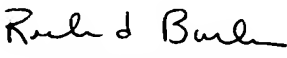
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It would have been prima facie obvious to connect the inlet and outlet tubes of Jurgensen horizontally because Hiai and Antell make clear that carrier gas can successfully be supplied to a vaporizer in that manner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (571) 272-1431. The examiner can normally be reached on 9 AM - 5:30 PM, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parvis Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Richard Bueker
Primary Examiner
Art Unit 1763